
MALWARE

A MALware Technical Report
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TECHNICAL REPORT

Roland TR-08 Rhythm Composer

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Abstract

An exploration of Roland's TR-808 Rhythm Composer through Roland's TR-08 miniaturized replica.

About the Author

Josette holds a PhD in English from the University of Colorado Boulder, and she researches popular and material culture and popular music. Josette currently works in the Education Department at the Country Music Hall of Fame and Museum in Nashville, TN. She recently started taking drum lessons.

Background

This project began with my preoccupation with the Roland TR-808 Rhythm Composer (also referred to simply as the 808) both as it relates to its distinctive percussive rhythms and its influence on popular music. Manufactured by the Japan-based Roland Corporation from 1980 to 1983, the 808 was intended as a rhythm machine for backing tracks and was aimed at musicians without a drummer. The 808 was reminiscent of earlier electronic drum machines that came with already programmed rhythms, but the 808 gave users the capacity to write and record 32 different rhythms, use up to 11 different percussive sounds plus accents (with 16 total available instruments), and gave each percussive sound its own level of control for mixing. When someone gestures to an 808 sound, they are most likely referring to one or more of the machine's specific percussive, electronic sounds and their unique sonic character: a low frequency, boomy sub bass; a kick drum with lots of decay; an extra snappy snare drum, ticking high-hats, hissing cymbals, spacey cowbell, a tinny hand clap, among others.

Although it would become massively influential, the 808 was initially a commercial failure, in part due to its hefty price tag (approximately \$1,200 in 1980), its limited functionality, and because it didn't sound like real drums. However, used devices were sold and resold at a more affordable price in pawn shops, second-hand music stores, and (later on) via the internet. The machine's second life made the 808 a more accessible device and offered a novel sound for DJs and musical artists. Black artists' use of the 808 in freestyle, hip-hop, pop, electronic, funk, and soul popularized 808 rhythms, gave the 808 cultural and musical relevance, and influenced the digitally created 808 sounds heard on contemporary songs. The 808 likely would have remained little more than a footnote in music history had it not also gained popularity with freestyle DJs, specifically Black DJs who made up the South Bronx rap scene in the early 1980s. A particularly important moment in 808 history is the drum machine's use on Afrika Bambaataa & Soulsonic Force's electro-funk, hip-hop track, "Planet Rock" (1982). "Planet Rock" features an 808 pattern, which includes a ticking closed-hi hat, repetitive cowbell, and robotic-sounding hand clap. The

track's (wompy sounding) bass drum and (snappy sounding) snare drum are particularly powerful but they often drop out of the pattern to make space for other rhythms. Similar patterns to "Planet Rock" (especially ones featuring a ticking closed hi-hat) can be heard on other early hip-hop tracks by artists like RUN-D.M.C., The Beastie Boys, and Sir Mix-A-Lot. The Bronx was by no means the only place where the 808 played an important role. Especially as the 808's low frequency bass requires booming speakers to register sonically, 808 rhythms were well-suited to regional freestyle genres associated with car and dance club cultures, like Miami Bass, New Orleans bounce, Ghetto house, and footwork/Chicago Juke.

Outside of these regional genres, analog 808 rhythms became more distinctive and identifiable because of their use in chart topping hits like Phil Collins's "In the Air Tonight" (1981), Marvin Gaye's "Sexual Healing" (1982), and Whitney Houston's "I Wanna Dance with Somebody (Who Loves Me)" (1987). 808 sounds resurfaced in the early to mid 2000s when artists like Outkast, Lil Jon, and Kanye West (the machine conceptually inspiring his 2008 album *808s & Heartbreak*) paid homage to and reimagined the 808 sound and aesthetic on their albums. Electronic DJs altered and manipulated 808 sounds to create an entirely new 808 soundscape—as heard on Felix Da Housecat's "Kickdrum" (2009), for instance. Contemporary DJs, like Denver-based [DJ A-L](#), incorporate vintage drum machines like the 808 into their sets. When it comes to contemporary, digitally produced songs, 808 samples and digitally altered 808-inspired rhythms are everywhere: there is a slightly altered 808 bass line on Jack Harlow's "WHAT'S POPPIN" (2020), a tinkling cowbell on Lizzo's "Boys" (2019), and a handclap on BRELAND and Keith Urban's trap-county track "Throw it Back" (2021), just to name a few. 808 rhythms have been used in hop-hop, freestyle, pop, acid house, electro, rock, crunk, trap, drum and bass, Miami Bass, New Orleans bounce, Ghetto house, footwork/Chicago juke, R&B, and techno, among other genres. Musical artists used the Roland TR-808 in unintended ways and established the drum machine as a musical instrument in its own right.

Introduction

I became fascinated with the Roland TR-808 as a cultural artifact and the pervasiveness of 808 rhythms in popular music while teaching Writing on Music, an upper-division writing course at the University of Colorado Boulder. When writing and talking about contemporary music, students would often isolate the "808 kick" as a highly identifiable percussive sound. It makes sense then that Roland's current website points out: "For some younger music fans, the 808 is no oddity—it's simply 'what drums sound like.'" When I started (pointedly) listening to songs that incorporated 808 rhythms, either analog 808 rhythms or digital samples, the "808 kick" was actually the sound that least captured my ear; instead, it was the 808 instruments that aren't part of a typical drum kit that I tended to notice most: the cowbell, handclap, claves, bongos,

and maracas. Moreover, I was captivated by persistent references to the 808 in artists' lyrics. Here are a few examples:

"Cause the 808 kick drum makes the girlies get dumb"

— Sir Mix-A-Lot, "Posse On Broadway" (1988)

"But I know y'all wanted that 808. Can you feel that B-A-S-S, bass?"

— Outkast, "I Like the Way You Move" (2003)

"I'm back with the 808 'cause I'm bossy"

— Kelis (feat. Too Short), "Bossy" (2006)

"You got me hypnotized, I never felt this way. Got my heart beating like an 808"

— Britney Spears, "Break the Ice" (2007)

"Come on, just a snare and an 808. Weezy baby on the mic, D.O.A."

— Lil Wayne, "Let the Beat Build" (2008)

"But the Eight-Oh-Eight is banging, I can't seem to fight the feeling"

— Big Grams (feat. Skrillex), "Drum Machine" (2015)

"You'll think it's 808 the way this beat knocking. Florida boy shit, when they hear it, they go to boppin"

— LPB Poody, "Batman" (2021).

Lyrics like these signal a mutual understanding, not just between musical artists and music producers but between artists and their listeners, that 808 rhythms have been and remain a significant part of the sonic architecture of popular music, and that the 808 itself serves as a legible cultural signifier for that complex and ongoing history. 808 sounds have such a unique sonic character that similar rhythms become associated with the 808 whether or not they were created using an actual TR-808 drum machine or not. These rhythms and their cultural significance are so apparent that listeners would recognize that Kelis is using 808 samples on "Bossy," would possibly mistake LPB Poody's baseline on "Batman" for an 808, and would register that someone has got Brittany Spears's heart beating like an 808 kickdrum (so, pretty fast). For Lil Wayne, the 808 is such a significant instrument on "Let the Beat Build"—starting with a looping sample, Eddie Kendricks's "Day by Day" (1972), and layering in 808 sounds (handclaps, high hats, and snare)—that he uses his verses to call attention to the drum machine more than once: "Deezle, let me just get the 808/As I hit the kill switch/Now that's how you let the beat build, bitch."

The more familiar I became with 808 sounds and rhythms, the more I heard 808 drum patterns everywhere. I wanted to research the use of 808 rhythms in popular music, but I also wanted to step outside my comfort zone and become better able to identify and describe percussive sounds, learn more about music

production, and gain more technical capabilities. I wanted to play around with and program 808 drum patterns on a Roland TR-808 myself. Unfortunately I'd be hard pressed to find an original, working TR-808; if you can find one, they run between \$6,000 and \$12,000 (Jazzy Jay's TR-808, with "AFRIKA BAMBAATAA" carved into the side, recently sold for around \$20,000 at Sotheby's). Luckily for me, Roland started producing a much more affordable and compact alternative in 2017, the Roland TR-08, a faithful, miniaturized replica of the TR-808. Thanks to the Media Archaeology Lab's MAL x (Race + Technology) Micro-Grant, I was able to get hands-on experience with the TR-808 through the TR-08 reproduction.

Roland TR-08 Rhythm Composer:

The Roland TR-08 (released in 2017) is a faithful replica of the original, only miniaturized:

808 Dimensions: 508 x 305 x 105 mm; Weight: 5 kg

08 Dimensions: 308 x 130 x 51 mm; Weight: 1.3 kg

Like the original 808, the TR-08 has analog circuit technology as well as modern touches like a sequencer, trigger out, LED display, and mini-USB connection. The TR-08 has a number of other features and capacities that I didn't explore in this project. Consult the manuals for the [TR-08](#) and the [TR-808](#) for more details.

POWER ON/OFF AND STOP/START



The TR 08 has a **POWER ON/OFF** switch located in the back of the machine and push on/push off **START/STOP** button which begins or ends a rhythm track.

STEPS



Each rhythm track has 16 steps (4 beats) and each step can be programmed to play one or more instruments at a time in order to create a drum pattern. These steps are divided into **BASIC RHYTHM** (1-12) and **INTRO/FILL IN** (1-4). Users can assign priority to either **BASIC RHYTHM** or **INTRO/FILL IN** steps and this determines which plays first when you hit **START**. I never used this feature and only ever started playing patterns from steps 1-16.

The step buttons are also used in programming patterns (more on that in the Process section).

MODE SELECTOR & INSTRUMENT SELECT



There is a mode selector knob that allows users to play, program, and store patterns. I used the 08 to program and playback 808 patterns and not to write

or store patterns permanently. I only used two modes: **PATTERN CLEAR** and **1ST PART**. Turning the knob to **PATTERN CLEAR** clears a pattern (which also requires pressing the step button that the pattern is stored on and then pressing the red **TRACK CLEAR** button). The mode selector knob needs to be turned to **1ST PART** (or **2ND PART**) in order to program instruments into the different steps that make up a rhythm track and create a pattern. The **1ST PART** position selects the first selection of an individual measure to be programmed and the **2ND PART** allows the second part of an individual measure to be programmed.

There is a 12-position **INSTRUMENT SELECT** knob that allows users to choose between 11 different instruments and an accent. The **BassDrum**, **SnareDrum**, **CowBell**, **Cymbal**, **OpenHiHat**, **Cls'dHiHat**, and **Accent** can be selected, programmed, and combined with any other instrument. Users can also select either the **LowTom**, **MidTom**, **HighTom**, **RimShot**, or **HandClap**. Once one of these five instruments is selected using the **INSTRUMENT SELECT** knob, users can use the instrument edit panel and switch between one of two instruments: **LowTom/LowConga**, **MidTom/MidConga**, **HiTom/HiConga**, **RimShot/Claves**, **HandClap/Maracas**. Among these five categories, it is not possible to play or write both instruments simultaneously (i.e., one cannot simultaneously use the **RimShot** and **Claves**).

INSTRUMENT EDIT



The different instrument edit controls help give the 808 instruments their unique sonic character. Here is where users can switch between instruments and control the level of each instrument. Users can adjust the **DECAY** and **TONE** of the **BassDrum**; **TONE** the **SnareDrum** and make the **SnareDrum** more or less **SNAPPY**; **TUNE** the **Hi/Mid/Low Congas** and **Toms**; adjust the **DECAY** and **TONE** of the **CYMBAL**; and adjust the **DECAY** of the **OpenHiHat**.

BASIC VARIATION



The **BASIC VARIATION** switch selects which of the two modes (**A** or **B**) will play. Each mode can be played independently or one after the other. The **A** mode plays the **A** pattern while the **B** mode plays the **B** pattern. Keeping the switch on **AB** plays the **A** pattern followed by the **B** pattern repetitively. Most popular 808 drum patterns have an **A** and **B** pattern. I mainly stuck to programming patterns that had no more than one 16-note measure on each variation, but based on looking at many 808 drum patterns the 808 appears able to hold multiple measures on each variation. Look at graphic designer Rob Ricketts's "[Program Your 808](#)" posters for a visualization of **A** and **B** 808 drum patterns.

TEMPO

There are two tempo control buttons. The **TEMPO** knob allows users to adjust the tempo in increments of 5–10 (from 40–300 BPM), and the **FINE** knob allows users to further select a precise tempo.

Process:

In his full interview for the documentary film "808": The Heart of the Beat That Changed Music (2015), [Phil Collins](#) claims he still doesn't know how to use an

808 properly. If Phil Collins doesn't know how to use an 808 properly, then I certainly don't either. With that caveat in mind, I will offer a summary of my efforts to develop some basic familiarity with the 808/08.

I began by amassing a variety of famous 808 drum patterns from different sources on the internet. I consulted patterns from Doctor Mix's [Super 808 Sound Pack](#), [808.pixll.de](#), Rob Ricketts's "Program Your 808" posters, and various YouTube videos with instructions on how to program specific drum patterns. Most often, the various 808 drum patterns I found for a specific song didn't match each other exactly. So, I'd usually program a pattern using one of them as a starting guide, check it against the others, and then listen to what I programmed against the original recorded song, using my own ear to correct discrepancies and adjust the tempo as best as I could.

In order to develop some rudimentary understanding of the basics of programming patterns on the 08, I searched for YouTube videos that talked me through the machine's various functions. I mainly followed Sean Divine's ["Roland TR-08 Quick Start Demo."](#) With some of those basics understood, I could then more easily follow patterns from resources such as Doctor Mix's linked above, as well as make small adjustments when necessary to better match how I heard the recordings.

An important first step when beginning to program a new pattern is to clear any previously stored pattern so that a new pattern can be programmed onto it. To do so, I first turned the mode selector to **PATTERN CLEAR**. Then I pressed one of the step buttons to clear any patterns from it (for example, step 9). This is how individual steps store patterns (in addition to storing instruments to make patterns). I then hit the red **TRACK CLEAR** button to clear the pattern. The red LED light on whatever step I pressed and cleared would start flashing, indicating that I could now start programming a new track and store it on that step.

To start programming patterns, I turned the mode selector to **FIRST PART**. I programmed A and B patterns by keeping the **BASIC VARIATION** switch on A when I was programming the A part of a pattern, and then switching the selector to B when I was programming the B part of a pattern. This seemed to work well enough, at least in the short term, so that when I pressed a step to hear the pattern I programmed playback, the 08 would run through A, B, or AB depending on where the **BASIC VARIATION** switch was.

While programming patterns, I'd press **START** so I could hear the instruments I was programming as I was programming them. I moved the **INSTRUMENT SELECT** to the instrument I wanted to program and pressed all the steps I wanted that instrument to play on. I then repeated this step for all the different instruments included in a pattern until it was fully programmed. I would then play the pattern and adjust the tempo using **TEMPO** and **FINE**. I mainly just programmed the patterns and left the instrument edit controls at mid-levels (or

forgot to pay attention to them). I repeated this process to program about 15 different famous 808 patterns on the 08.

Here are two examples:

Demonstration video of the drum pattern for Marvin Gaye's "Sexual Healing" can be found at: vimeo.com/834180384

Demonstration video of the drum pattern for Marvin Gaye's "Sexual Healing" played alongside the recording of the song can be found at: vimeo.com/834180421

I programmed Marvin's Gaye's "Sexual Healing" (1982) by following the "Sexual Healing" 808 drum pattern created by Doctor Mix. I programmed the pattern and then played it with the original recorded song to check the pattern's accuracy and the tempo as best I could.

THE A PATTERN FOR "SEXUAL HEALING" LOOKS LIKE THIS



Marvin Gaye - "Sexual Healing" 808 Pattern
100 Bpm - Variation A

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
AC	•				•								•			
CH	•		•	•	•		•		•		•		•		•	•
OH							•									
CP					•											
RS	•			•			•									
HT			•													
MT																
LT																
SD											•	•				
BD	•							•	•		•		•			•

DoctorMix.com

BassDrum: Steps 1, 8, 9, 11, 13, 16

SnareDrum: Steps 11, 12

HiTom: Step 3

Claves*: Steps 1, 4, 7

HandClap: Step 5

OpenHiHat: Step 7

Cls'dHiHat: Steps 1, 3, 4, 5, 7, 9, 11, 13, 15, 16

Accent: Steps 1, 5, 13

*Doctor Mix's pattern template indicates RS (**RimShot**) but the switch between **RimShot/Claves** is switched to **Claves** on the instrument edit panel on "Sexual Healing."

THE B PATTERN FOR "SEXUAL HEALING" LOOKS LIKE THIS



Marvin Gaye - "Sexual Healing" 808 Pattern

100 Bpm - Variation B

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
AC																
CH	•		•		•		•		•	•	•		•		•	•
OH			•				•				•			•		
CP					•											
RS	•			•			•				•			•		
HT			•													
MT							•									
LT													•		•	
SD							•	•		•		•		•		
BD	•								•							•

DoctorMix.com

BassDrum: 1, 9, 16

SnareDrum: 7, 8, 10, 12, 14

LowTom: 13, 15

MidTom: 7

HighTom: 3

Claves*: 1, 4, 7, 11, 14

HandClap: 5

OpenHiHat: 3, 7, 11, 14

Cls'dHiHat: 1, 3, 5, 7, 9, 10, 11, 13, 15, 16

*Doctor Mix's pattern template indicates RS (**RimShot**) but the switch between **RimShot/Claves** is switched to **Claves** on the instrument edit panel on "Sexual Healing."

Particularly notable sounds on “Sexual Healing” are the **Claves**, **Low/Mid/Hi Toms**, and the **HandClap**, which is programmed onto step 5 in both A and B patterns. I played the song at 94 BPM (not 100 BPM as indicated on Doctor Mix’s worksheet). When playing the 08 alongside the recorded song, the tempo felt like it got faster on certain beats, so I switched it between 94 and 95 BPM as the song played.

I also programmed the Beastie Boys’ “Brass Monkey” (1987). This pattern was a bit more tricky. I consulted different variations of “Brass Monkey’s” 808 drum pattern and used those to influence what I ended up programming. Most helpful was Joe Jahnigen’s [“How To Program ‘Brass Monkey’ TR-808”](#) video. For this pattern, I used one of Doctor Mix’s blank worksheets to write out the pattern that I ended up with.

“Brass Monkey” has an A and B pattern, but the pattern also has an additional 16 steps (4 beats) of solo **Cls’dHiHats** (a fill), which I wrote out as pattern C.

“BRASS MONKEY’S” DRUM PATTERN IS ARRANGED IN THIS ORDER

Beastie Boys "Brass Monkey"

BPM: 116

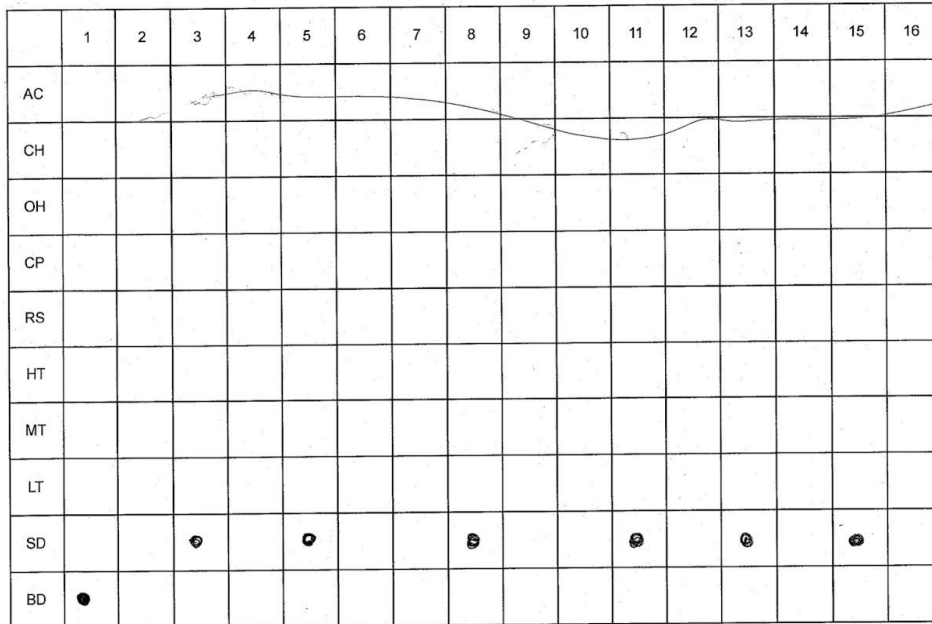
(A)

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
AC																
CH	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
OH																
CP																
RS																
HT																
MT																
LT																
SD					•								•			
BD	•								•		•					



Beastie Boys "Brass Monkey"
BPM: 114

⑬

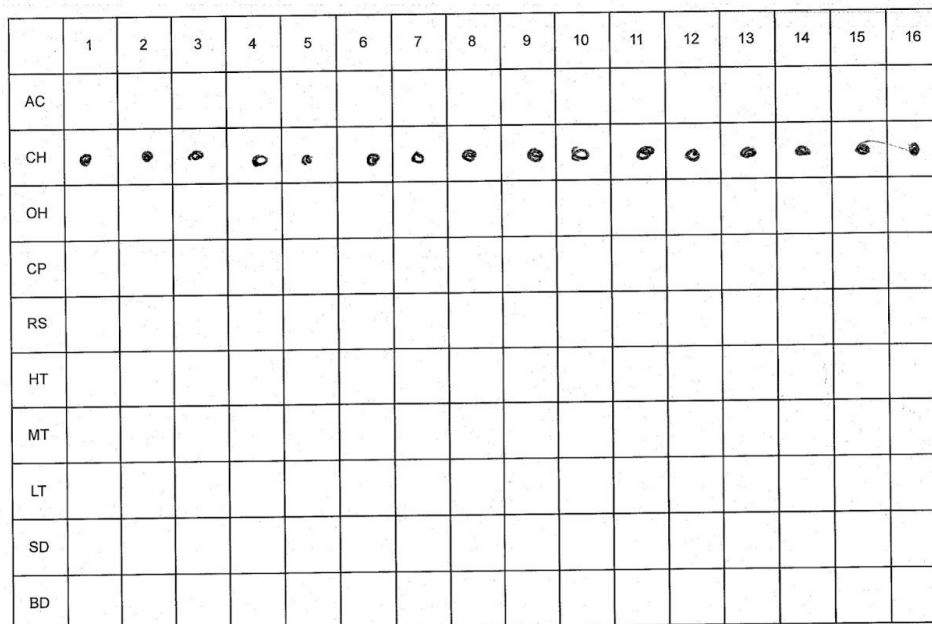


DoctorMix.com



Beastie Boys "Brass Monkey"
BPM: 114

⑭



DoctorMix.com

Pattern A: Plays 3X

Pattern C (Fill): (Solo Cls'dHiHats): Plays 1X

Pattern A: Plays 3X

Pattern B: Plays 1X

Demonstration video of the drum pattern for the Beastie Boys' "Brass Monkey" can be found at: vimeo.com/834180329

Unlike "Sexual Healing," for example, the **BASIC VARIATION** switch cannot remain in the AB position on "Brass Monkey." The switch has to be manually switched between A and B while playing to create "Brass Monkey's" drum pattern. I wasn't able to determine a way to program a fill on the 08 without delving deeper into writing, storing, and scheduling patterns. So, I created a third pattern by soloing the **Cls'dHiHats** from the A pattern. I pressed **START** as I let A play three times. As soon as I started the track, I manually soloed the **Cls'dHiHats** from the A pattern by holding down the **BANK/TEMPO/SHUFFLE** button and the button above **Accent** (which is unlabeled) and then pressing **TAP**. This combination of button presses is used to either mute or solo one particular instrument. When the A pattern started playing for the third time, I pressed step 12 to solo the **Cls'dHiHat** and let 16 steps of **Cls'dHiHats** play over 4 beats to create pattern C. I pressed step 12 again in order to un-solo the **Cls'dHiHat** and let pattern A play three more times. After the A pattern started playing for the third time, I then manually switched the **BASIC VARIATION** switch to pattern B so that pattern B would play through once. Once pattern B started, I switched the **BASIC VARIATION** switch back to A so that pattern A would play one last time and end the entire drum pattern.

Pedagogical Application

Once I had gained some familiarity with the 808/08, I wanted to integrate the TR-808 drum machine into my Writing on Music course. Students read about the 808 and listened to and compared and contrasted songs with analog and digital 808 rhythms. They also programmed famous 808 drum patterns using [iO808](#), a fully recreated web-based TR-808 drum machine. I also showed them [808.303 studio](#), a musical interface created in collaboration with Roland that emulates the sounds of the 808 and the [TB-303 Bass Line](#) but doesn't replicate the original interfaces or programmability. All students chose to work with the iO808 and navigated the web-based 808 interface with ease. Once they had programmed all of the 808 patterns I'd provided, some students started to play around with their own beats. What I found most exciting about students' engagement with the 808 was the way it helped them make connections between and among popular music and other media. For instance, once students listened to and programmed some of the drum pattern for "Planet Rock," it became immediately identifiable to them as a sample on City Girls' "Twerkulator" (2021). Similarly, L'Trimm's "Cars That Go Boom" (1988)—a Miami Bass celebration of subwoofers with undeniable 808 sub-bass and constant 808 hi-hats, and which made a comeback via [TikTok](#) in early 2020—

gained new relevancy when situated within the history and soundscape of the TR-808.

Conclusion:

I did achieve the goals I set out for this project. I now have a richer understanding of the historical, cultural, and musical significance of the TR-808 drum machine, songs featuring 808 rhythms, and Black musical artists' significant influence on popular music via the 808. Working with an actual (08) drum machine did allow me to better identify percussive sounds and has helped build my musical vocabulary. While I won't be grabbing an 808/08 to DJ beats anytime soon, interacting with a technical interface also gave me some rudimentary knowledge of audio mixing. Thanks to libi rose striegl, Lori Emerson, and the Media Archaeology Lab at CU Boulder for supporting this project. And thanks to Brian Rejack, Will Shelton, Adam Darby, Adam Bradley, DL A-L, DJ Lazy Eyes, Steve Knopper, and my Writing on Music students at CU for lending me their musical knowledge (and writing about music knowledge) and their close-listening ears.

To conclude, I offer this [playlist](#). It contains famous and not so famous 808 tracks and songs that might not actually even use an 808 rhythm at all. But whenever my ear hears that 808 sound, I add it here.

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